

WHAT IS CLAIMED IS:

1. A torque controlling apparatus for a hybrid vehicle, comprising:

5 a clutch rate adjustable clutch, an output axle of the clutch being connected to driven wheels;

an engine;

a generator, both of the engine and the generator being connected to an input axle of the
10 clutch;

a motor connected to the output axle of the clutch; and

a controller to control a vehicular propelling torque transmitted to the driven wheels under a
15 predetermined torque distribution condition, the controller including: a power supplying section that makes the motor perform a power running by supplying a generated electric power obtained as a result of a drive of the generator by the engine to the motor;
20 and a torque distribution section that distributes an engine torque into a clutch transmission torque transmitted to the driven wheels via the clutch and a generation torque transmitted to the generator, the torque distribution section controlling the clutch
25 rate of the clutch and the generation torque of the generator on the basis of at least a vehicular velocity.

2. A torque controlling apparatus for a hybrid
30 vehicle as claimed in claim 1, wherein the torque distribution section controls the clutch rate of the clutch and generation torque of the generator in such a manner as to maximize a vehicular propelling

torque.

3. A torque controlling apparatus for a hybrid vehicle as claimed in claim 1, wherein the torque
5 controlling apparatus further comprises a battery to perform a power supply and receipt of the electric power to and from the generator and the motor and the predetermined torque distribution condition includes a condition that an output enabling power of the
10 battery is limited or inhibited.

4. A torque controlling apparatus for a hybrid vehicle as claimed in claim 3, wherein a torque distribution ratio of the generation torque with
15 respect to the engine torque is corrected in accordance with an output enabling power of the battery.

5. A torque controlling apparatus for a hybrid
20 vehicle as claimed in claim 1, wherein the predetermined torque distribution condition includes a condition under which the vehicle is started or the vehicle is running at a predetermined low vehicular velocity.

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6. A torque controlling apparatus for a hybrid vehicle as claimed in claim 1, wherein, as the vehicular velocity becomes higher, the clutch rate of the clutch becomes larger.

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7. A torque controlling apparatus for a hybrid vehicle as claimed in claim 1, wherein the torque distribution ratio of the generation torque with

respect to the engine torque is corrected in accordance with a magnitude of a heat of at least one of the clutch, the generator, and the motor.

5 8. A torque controlling apparatus for a hybrid vehicle as claimed in claim 7, the ratio of the distribution of the engine torque to the generation torque of the generator is reduced as the magnitude of the temperature of at least one of the generator
10 and the motor becomes higher.

9. A torque controlling apparatus for a hybrid vehicle as claimed in claim 8, wherein the clutch rate of the clutch is 100 % to completely clutch the
15 clutch and the ratio of the distribution of the engine torque to the generation torque of the generator is zeroed if the magnitude of the one of the generator and the motor is in excess of a predetermined upper limit.

20 10. A torque controlling apparatus for a hybrid vehicle as claimed in claim 4, wherein, the ratio of the distribution of the engine torque to the generation torque of the generator is 0 % and the
25 clutch rate of the clutch is 100 % to completely clutch the clutch, if an output power of the battery is equal to or larger than a predetermined power value.

30 11. A torque controlling apparatus for a hybrid vehicle as claimed in claim 1, wherein a sum of the clutch transmission torque and an output torque of the motor is the vehicular propelling torque.

12. A torque controlling apparatus for a hybrid vehicle as claimed in claim 1, wherein the generator and the motor constitute a three-phase alternating
5 current motor/generator.

13. A torque controlling apparatus for a hybrid vehicle as claimed in claim 1, wherein the clutch comprises a frictional clutch.

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14. A torque controlling apparatus for a hybrid vehicle as claimed in claim 3, wherein the power supplying section makes the motor perform the power running by supplying directly the generated power
15 obtained by the drive of the generator by the engine to the motor without intervention of the battery.

15. A torque controlling apparatus for a hybrid vehicle as claimed in claim 1, wherein a ratio of
20 the distribution of the engine torque to the generator becomes reduced as the vehicular velocity becomes increased.

16. A torque controlling apparatus for a hybrid
25 vehicle as claimed in claim 7, wherein, as a temperature of the clutch becomes higher, a ratio of the distribution of the engine torque to the clutch transmission torque becomes reduced.

30 17. A torque controlling apparatus for a hybrid vehicle as claimed in claim 16, wherein the clutch transmission torque is zeroed if the temperature of

the clutch is in excess of a predetermined temperature value.

18. A torque controlling apparatus for a hybrid
5 vehicle as claimed in claim 17, wherein the clutch rate of the clutch is 0 % to completely release the clutch, if the clutch transmission torque is zeroed.

19. A torque controlling apparatus for a hybrid
10 vehicle, comprising:

clutch rate adjustable clutch means, an output axle of the clutch means being connected to driven wheels;

primary power source means;

15 power generation means, both of the primary power source means and the power generation means being connected to an input axle of the clutch means;

secondary power source means connected to the output axle of the clutch means; and

20 controlling means for controlling a vehicular propelling torque transmitted to the driven wheels under a predetermined torque distribution condition, the controlling means including: power supplying means for making the secondary power source perform a
25 power running by supplying a generated electric power obtained as a result of a drive of the power generating means by the engine to the secondary power source means; and torque distribution means for distributing a torque generated by the primary power
30 source into a clutch transmission torque transmitted to the driven wheels via the clutch means and a generation torque transmitted to the power generating means, the torque distribution means controlling a

clutch rate of the clutch means and the generation torque of the power generating means on the basis of at least a vehicular velocity.

5 20. A torque controlling method for a hybrid vehicle, the hybrid vehicle comprising:

a clutch rate adjustable clutch, an output axle of the clutch being connected to driven wheels;

an engine;

10 a generator, both of the engine and the generator being connected to an input axle of the clutch; and

a motor connected to the output axle of the clutch, and the torque controlling method comprising:

15 controlling a vehicular propelling torque transmitted to the driven wheels under a predetermined torque distribution condition;

making the motor perform a power running by supplying a generated electric power obtained as a
20 result of a drive of the generator by the engine to the motor;

distributing an engine torque into a clutch transmission torque transmitted to the driven wheels via the clutch and a generation torque transmitted to
25 the generator; and

controlling a clutch rate of the clutch and the generation torque of the generator on the basis of at least a vehicular velocity.